Remarks

Claims 1, 2, and 4-31 are now pending in this application. Applicants have not amended the claims. Applicants respectfully request favorable reconsideration of this application.

The Examiner rejected claims 1, 2, and 14-31 under 35 U.S.C. § 103(a) as being unpatentable over U.S. patent publication 2002/0070428 to Bernhoff et al. in view of U.S. patent 6,228,904 to Yadav et al.

The combination of Bernhoff et al. and Yadav et al. does not suggest the claimed invention since, among other things, the combination does not suggest a polymeric matrix including a filler, wherein the filler includes a resistive and/or capacitive field grading effective amount of particles having at least one dimension smaller than or equal to 100 nm. In paragraph 0037, Bernhoff et al. suggests a material that could include a polymer and particles. Bernhoff et al. states that this embodiment is shown in Figs. 3 and 4. However, Bernhoff et al., only suggests nano-size particles in an embodiment in which the particles are dispersed in water. This is described in paragraph 0038 and shown in Fig. 5. Bernhoff et al. explicitly differentiates from the embodiment shown Figs. 3 and 4 and described in paragraph 0037.

Bernhoff et al. does not suggest nano-size particles with any other material than water. This is also reflected in the claims. Along these lines, claim 26 recites particles having a size of 1-100 nm. However, claim 26 depends from claims 24 or 25, which only recite particles in liquid. Additionally, Bernhoff et al. does not suggest a composite material for grading an electric

field in high voltage applications, a filler that includes a resistive and/or capacitive field grading effective amount of particles, particles that have an energy bandgap larger than 0 eV and smaller than 5 eV, or how to obtain an increased electrical breakdown strength of a field grading material such that the material can be used at high-voltage applications.

In view of the above, Bernhoff et al. does not suggest a polymer filled with particles having a size of 1-100 nm. Bernhoff et al. is also silent on the energy bandgap of the particles. Furthermore, Bernhoff et al. is silent on the amount of the particles in the polymer. Contrary to the Examiner's assertion, Bernhoff et al. does not suggest the claimed invention with the exception of the specific amount of particles.

Yadav et al. also does not suggest a composite material for grading an electric field in high voltage applications. Additionally, Yadav et al. does not suggest a filler that includes a resistive and/or capacitive field grading effective amount of particles. Furthermore, Yadav et al. does not suggest particles that have an energy bandgap larger than 0 eV and smaller than 5 eV. Yadav et al. does not include any suggestion of how to obtain an increased electrical breakdown strength of a field grading material such that it can be used at high-voltage applications.

While Yadav et al. may suggest a large number of different nanoparticles in different types of matrices, such as a ceramic or a poymeric matrix, Yadav et al. only suggests one example of an electric device using a nanocomposite in Example 5. The nanocomposite in Example 5 includes a zinc oxide matrix with a nanofiller. In other words, Yadav et al. does not suggest a polymeric matrix as in the claimed invention. Bernhoff et al. also does not suggest

nano-size particles in combination with anything but water. Even if Bernhoff et al. and Yadav et al. were combined, the combination would not suggest the claimed invention.

Yadav et al. is mainly concerned with changes in resistivity of composite materials when using nano scale powder instead of a micron scale powder. Examples 1-3 of Yadav et al. gives three examples of nanocomposites with a polymeric matrix. None of these examples suggests a field grading material.

Additionally, none of the examples of Yadav et al. suggests the problem of or a solution to the problem of changes in resistivity of a composite material when using nano-scale powder instead of a micron scale powder. Most of the examples of Yadav et al. show that resistivity decreases when nanoparticles are used instead of micron particles. For example, in Example 1 the resistivity for 20 vol% nanoparticles of Indium Tin Oxide (ITO) in PMMA is $1.75x10^4$ ohm-cm, and the resistivity for 20 vol% micron scale ITO in PMMA was $8 x10^8$ ohm-cm. This is opposite to the claimed invention. Along these lines, Applicants direct the Examiner's attention to Fig. 5.

Bernhoff et al. does not suggest nano-size particles in an embodiment that includes a polymeric field grading material and/or in a resistive and/or capacitive field grading effective amount. These differences between the invention and the combination of Yadev et al. and Bernhoff et al. result in materials having quite different properties and than the claimed invention. Accordingly, the combination of Yadev et al. and Bernhoff et al. does not suggest the claimed invention.

In view of the above, the references relied upon in the office action do not suggest patentable features of the claimed invention. Therefore, the references relied upon in the office action do not anticipate the claimed invention or make the claimed invention obvious. Accordingly, Applicants submit that the claimed invention is patentable over the cited references and respectfully request withdrawal of the rejection based on the cited references.

In conclusion, Applicants respectfully request favorable reconsideration of this application and issuance of the notice of allowance.

If an interview would advance the prosecution of this application, Applicants respectfully urge the Examiner to contact the undersigned at the telephone number listed below.

The undersigned authorizes the Commissioner to charge fee insufficiency and credit overpayment associated with this communication to Deposit Account No. 22-0261.

Respectfully submitted,

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